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Definition of the intense and deformable jaw state under the masseters hyper tone

Shigapova F., Mustakimova M., Saleeva G., Sachenkov O.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© Research India Publications. Current research considers the hypothesis of masseter muscle hyper tone as one of the factors for gingiva recession. By means of bio-mechanical modeling operation the three-dimensional solid-state model was constructed. Thus the assessment of movements and gingiva pressure intensity in areas of cutters and canines was made. The problem of intense strained state definition was solved using finite element method. The model allows to consider influences of chewing and temporal muscles. Problem definition is the linear isotropic, taking into account the following contact interactions: dentition – gum, gum — bone. In final element sampling the tetrahedral and hexsahedral finite elements from the linear approximation were used. Within calculation the masseter muscles hyper tone was modeled by applying pressure, force amounts thus used were equal to: 100 N, 300 N, 700 N, 1300 N in various combinations. The analysis of pressure intensity results for dentition showed that the maximal pressure arises in the cutters area. While applying different types of loading qualitative change does not take place, however, pressure intensity values change. The contact pressure assessment for areas of dentition contact among themselves and with jaw was made. The distribution picture is similar to a picture of pressure intensity distribution — larger contact stresses fall onto a place where cutters contact, at various schemes of loading the picture changes quantitatively. The detailed analysis of the results received is given in the article.

Keywords

Bodily machinery (bio-mechanics), Contact stresses, Hyper tone, Masseter muscles